

**AMENDMENTS TO THE SPECIFICATION**

**Please amend the paragraph that bridges pages 60 to 62 as follows:**

As shown in Fig. 33, the aforementioned structure allows the stress-induced and shape-induced magnetization anisotropy to exhibit the easy axes in the same direction, and thereby stabilizes the characteristics of the free ferromagnetic layer 10. The bottom interconnection 2, which extends in the y-axis direction, exerts a tensile stress in the y-axis~~x-axis~~ direction (that is, the direction of the major axis of the free ferromagnetic layer 10), and a compressive stress in the x-axis~~y-axis~~ direction (that is, the direction of the minor axis of the free ferromagnetic layer 10). It should be noted that the inventors' investigation has depicted that the stress generated by the top interconnection 3 causes less influences on the free ferromagnetic layer 10. Since the magnetostriction constant  $\lambda$  of the free ferromagnetic layer 10 is positive, the compressive stress in the x-axis direction and the tensile stress in the y-axis direction, which are generated by the bottom interconnection 2, develop the stress-induced magnetic anisotropy with the easy axis in the y-axis direction, and thereby coincide the direction of the easy axis of the stress-induced magnetic anisotropy with that of the shape-induced magnetic anisotropy. The fact that the stress-induced and shape-induced magnetic anisotropies exhibit the easy axis in the same direction provides the free ferromagnetic layer 10 with large uniaxiality, and thereby allows the free ferromagnetic layer 10 to exhibit a single domain structure. This effectively stabilizes the characteristics of the free ferromagnetic layer 10. Specifically, the coincidence of the directions of the easy axes, resulting from the stress-induced and shape-induced magnetic anisotropy, improves the rectangularity of the field magnetization curve of the free ferromagnetic layer 10,

and additionally reduces the variation in the coercive force. An MRAM structure that does not allow the easy axes of the stress-induced and shape-induced magnetic anisotropy to be directed in the same direction causes variation in the direction of the easy axis of total anisotropy toward the write interconnection, and thereby undesirably destabilizes the characteristics of the free ferromagnetic layer 10.

**Please amend the paragraph that bridges pages 63 to 64 as follows:**

As is the case of the structure shown in Figs. 31 and 32, the structure shown in Fig. 34 coincides the direction of easy axis of the stress-induced magnetic anisotropy (K2) with that of the shape-induced magnetic anisotropy (K3), and thereby stabilizes the characteristics of the free ferromagnetic layer 10. As described above, the bottom interconnection 2, which extends in the y-axis direction, exerts a tensile stress in the y-axis~~x-axis~~ direction (that is, the direction of the minor axis of the free ferromagnetic layer 10), and a compressive stress in the x-axis~~y-axis~~ direction (that is, the direction of the major axis of the free ferromagnetic layer 10). Since the magnetostriction constant  $\lambda$  of the free ferromagnetic layer 10 is negative, the compressive stress in the x-axis direction and the tensile stress in the y-axis direction, which are generated by the bottom interconnection 2, develop the stress-induced magnetic anisotropy with the easy axis in the x-axis direction, and thereby coincide the direction of the easy axis of the stress-induced magnetic anisotropy with that of the shape-induced magnetic anisotropy.

**Please amend the first full paragraph on page 100 as follows:**

Next, the effect of the reduction in the product  $M_s \cdot t$ , which is allowed by forming the free ferromagnetic layer 10 with the ferromagnetic layer 3140a and the diffusion layer 3240b, has been investigated with samples described below:

**Please amend the paragraph that bridges pages 100 to 101 as follows:**

The  $\text{AlO}_x$  film relatively close to the substrate corresponds with the tunnel dielectric layer 9. The  $\text{Ni}_{81}\text{Fe}_{19}$  film corresponds with the ferromagnetic layer 3140a within the free ferromagnetic layer 10, and the non-magnetic metal layer corresponds with the diffusion layer 3240b. The  $\text{AlO}_x$  film relatively far from the substrate corresponds with the oxide layer 14, and the Ta film corresponds with the top contact layer 15. The  $\text{AlO}_x$  film corresponding with the tunnel dielectric layer 9 is formed through oxidization of an aluminum film of 1.5 nm in thickness with oxygen plasma, while the  $\text{AlO}_x$  film corresponding with the oxide layer 14 is formed through oxidization of an aluminum film of 0.65 nm in thickness with oxygen plasma. A tantalum films having thickness of 0.6 and 0.3 nm, a ruthenium film having a thickness of 0.3 nm, and a copper film having a thickness of 0.3 nm are used as the non-magnetic metal layer.

**Please amend the second full paragraph on page 102 as follows:**

The  $\text{AlO}_x$  film relatively close to the substrate corresponds with the tunnel dielectric layer 9, and the pair of the two  $\text{Ni}_{81}\text{Fe}_{19}$  films, which sandwiches the non-magnetic metal layer, corresponds with the ferromagnetic layers 3140a and 3340e, respectively. The non-magnetic

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metal layer corresponds with the diffusion layer ~~32+0b~~32+0b. Additionally, the  $\text{AlO}_x$  film relatively apart from the substrate corresponds with the oxide layer 14, and the Ta film relatively apart from the substrate corresponds with the top contact layer 15. The  $\text{AlO}_x$  film corresponding with the tunnel dielectric layer 9 is formed through oxidization of an aluminum film of 1.5 nm in thickness with oxygen plasma, and the  $\text{AlO}_x$  film corresponding with the oxide layer 14 is formed through oxidization of an aluminum film of 0.65 nm in thickness with oxygen plasma. A tantalum film of 0.3 nm is used as the non-magnetic metal film.